

ments more or less with age by the ankylosis of the sacral vertebræ, so as not to render the extent of the "sacrum" very variable. It would surely be well, then, to distinguish the human sacral vertebræ, like the ribs, into true and false, those being the true sacral vertebræ which abut against the ilium.

In Birds the determination of the homological relations of the different parts of the postdorsal part of the spinal column is a matter of much difficulty. On the whole, and seeing on the one hand the manifest homology between the sacral vertebræ of Man and Lizards by the help of Crocodiles and Tortoises, and on the other hand the manifest homology between the sacral vertebræ of Lizards and the posterior parapophysial vertebræ of most Birds, the authors think it better to regard the latter vertebræ in Birds as alone truly sacral, and to regard such forms as *Buceros*, *Pica*, and certain Parrots as differing from the rule of the Class in the suppression of their parapophysial processes, and *Fregatta* as differing from the same rule by the development of parapophyses in all the vertebræ of this region.

The sacral vertebræ in Birds may be defined, then, as "*vertebræ having one of the more postaxial roots of the sciatic plexus coming forth either immediately preaxiad or postaxiad, and having parapophysial transverse processes abutting against the ilium, such vertebræ being placed immediately postaxiad to vertebræ which are devoid of such parapophyses, or else being the homologues of a vertebra so conditioned in most birds.*"

By the combination of these two definitions, as given above (the one for Mammals, Reptiles, and Batrachians, and the other for Birds), it seems to the authors that the sacral vertebræ may be defined in all Vertebrata above Fishes which have pelvic limbs.

On the Nymph-stage of the *Embidæ*, with notes on the Habits of the Family, &c. By R. M'LACHLAN, Esq., F.R.S., F.L.S., &c.

[Read June 7, 1877.]

(PLATE XXI.)

Introductory Remarks.

IN the year 1837 Prof. Westwood published in the 'Transactions' of this Society (vol. xvii. pp. 369-375, pl. xi.) a memoir entitled "Characters of *Embia*, a Genus of Insects allied to the White Ants; with descriptions of the species of which it is composed," wherein he gave a résumé of the little hitherto known concerning

these singular insects, and subdivided the genus *Embia* (instituted by Latreille in 1825) into three, viz. *Embia*, *Oligotoma*, and *Olyntha*, each containing a single species, all that were known at that time. Forty years have elapsed since the publication of that paper; yet even at the present time the number of known species is very small. In 1837, only the larval (or absolutely wingless) form, and the fully developed insect had been observed; there remained a gap to be filled up. The analogy of the group with the *Termites* made it evident that the metamorphoses (or, rather, the partial absence of metamorphoses) were the same in both; yet the penultimate stage, in which the creatures should have abbreviated wings, remained to be discovered this has only just been done, and under very singular circumstances.

Quite at the end of last year Mr. W. H. Michael, of Highgate, an extensive grower of exotic orchids, discovered that a large mass of *Saccolobium retusum*, purchased from a London nurseryman, was apparently being damaged by some insect; and examination revealed the presence of numerous Embidæ on the roots concealed in silken tunnels. He visited the nursery whence they were obtained, and found there more examples, including a winged insect which was unfortunately lost. In the 'Gardener's Chronicle,' for Dec. 30, 1876, Mr. Michael gave an account of the discovery, illustrated by magnified figures (of which I shall presently have more to say), and accompanied by notes by Prof. Westwood in which a doubt was implied as to the damage to the orchids being occasioned by the Embidæ. In a subsequent number of the same periodical I gave a few notes in which I stated that Prof. Westwood's doubt appeared to be well founded. However, the sequel proved, tolerably to my satisfaction, that the insects had eaten the roots to some extent; but I still think that some old wounds on the plants, attributed by Mr. Michael's gardener to them, had resulted from other causes. About the same time I received from a mutual friend (Mr. W. A. Forbes) a well-grown larva, but showing no traces whatever of rudimentary wings. But the figure puzzled me much. It showed what appeared to be short rudimentary metathoracic wings, but no trace of the mesothoracic pair. I am of opinion that this pair had been accidentally destroyed, and that the figure give the first indication of the "nymph" stage in the group. On the 24th of January of this year I received a note from Mr. Michael's son with the information that "we have just discovered three *Embia*

nymphs," and inviting me to examine them. This I almost immediately did ; but there were then only two, one having escaped. Of these, one was kindly presented to me ; but it soon died (after having considerably decreased in size) owing to my inability to furnish it with the moist warm atmosphere no doubt necessary ; the other was retained in the hothouse, and subsequently developed into a perfect insect, an undescribed species of *Oligotoma*.

The nymph that died with me I placed in alcohol. It is now only 9 millimètres long, but was at least one third longer when I first had it. The rudimentary wings are elongate-oval in form, and show evident traces of neurulation. The mesothoracic pair extend to the posterior margin of the second abdominal segment. The general characters are but slightly modified ; but the legs (especially the anterior) more resemble those of the perfect insect than those of the wingless larval condition, and the eyes are considerably larger than in the latter. The antennæ (in this species) appear to be 24-jointed in all the stages (but young larvæ have not been examined) ; but the joints are more elongate in the perfect insect, and those at the base undergo considerable changes in length from the larval to the mature condition.

Habits &c. of the Embidæ.

Probably the first notice (at any rate the first of any importance) appeared in the great French work on the "Exploration scientifique de l'Algérie, Histoire naturelle des Animaux articulés, Insectes," pp. 113-114 (1849), from the pen of M. Lucas, who says he found *Embia mauritanica* "vivant en famille dans les lieux sablonneux, et se tenant sur les tiges des grandes herbes ; j'en rencontrai une douzaine d'individus, qui parcouraient de haut en bas une tige desséchée de *Scilla maritima* ; elle est très-agile, et se laisse saisir sans se servir de ses ailes pour prendre la fuite." "La larve que j'ai trouvée dans les environs d'Alger, se tient sous les pierres humides, et habite de petits fourreaux de soie, dans lesquels elle se retire lorsqu'on cherche à s'emparer d'elle. Elle est très-agile, carnassière, et n'est pas très-rare pendant la saison d'hiver. Ayant été obligé de partir pour Constantine dans les premiers jours de Mars, je n'ai pu suivre d'une manière bien détaillée les transformations de cette larve, et, à ce sujet, voici ce que j'ai remarqué : avant de quitter la province d'Alger, j'avais enfermé séparément, dans plusieurs boîtes,

quelques-unes de ces larves avec des insectes, afin qu'elles pussent se nourrir. À mon retour de la province de Constantine en Octobre, où je fis un séjour de huit mois, j'ouvris les boîtes dans lesquelles j'avais enfermé mes larves des *Embia*, et sur six de ces larves je n'en trouvai qu'une seule qui se fût transformée en insecte parfait. Quant aux autres, elles étaient mortes, et n'avaient pu résister à une si longue captivité."

Later on, in the 'Annales de la Société Entomologique de France' for 1859, pp. 441-444, M. Lucas returned to the subject. The greater part of his paper is only an extension of the notes above quoted; but there is some additional matter, and of importance. He says, "Quant à la matière soyeuse sécrétée par les larves de l'*Embia mauritanica*, elle est fournie pendant toute l'existence de ces larves, et cette matière n'est pas seulement destinée à leur servir d'abri, mais elle est encore employée à prendre les insectes qui servent à la nourriture de ces larves carnassières. En effet, si l'on observe ces fourreaux placés sous les pierres, on remarque que, dans les environs de ces habitations les larves de ce singulier Névroptère ont le soin de disposer çà et là des fils de soie qui sont autant de pièges destinés soit à prendre les insectes, soit à les avertir de leur présence." This statement was copied in M. Maurice Girard's excellent 'Traité élémentaire d'Entomologie,' tome ii. (fasc. 1) p. 295, published in 1876.

Dr. Hagen, writing in the 'Stettiner entomologische Zeitung' for 1849, p. 56, said that nothing had then been recorded as to the habits; but in the 'Verhandlungen des zool.-botanischen Gesellschaft in Wien' for 1866, p. 222, he alludes to M. Lucas's statement (in 'Ann. Soc. Fr.'), and he says he possesses a larva (probably of *E. Savignyi*) found under a stone at Athens. I have a larva of *E. Solieri* found by Mr. Pascoe at Hyères under a stone; so that this habit is evidently general, but decidedly not exclusive.

From the above-given extracts it will be noticed that M. Lucas states distinctly that the larvæ are carnivorous, and also that the webs serve the double purpose of entangling the insects that are used for food and of warning the *Embia* of the presence of insect enemies; but I fail to understand any direct or implied assertion that he had seen insects actually caught in the webs or being devoured by the *Embia*. Both the larvæ and nymphs of the species found on the orchids spun silken tunnels, not at all of the nature of spiders' webs, but similar to those formed by many Lepidopterous larvæ, and which serve them as a protection from

their enemies; and the analogy is the more complete because the silken galleries are not perfect tubes, but more of the nature of coverings, the larva being protected above and able to feed on the surface of the vegetable matters on which it rests at the same time. Having in mind M. Lucas's assertions, I certainly doubted if the *Embia* larvæ caused any injury to the orchids; but having seen pieces of roots, placed in a box with the larvæ, freshly gnawed, I now suspect that a mistake has been made as to the supposed carnivorous habits of the species of the group. and that in reality they are vegetable feeders, as are the Termitidæ; for the latter will sometimes attack *growing* vegetable materials. There still, however, remains a difficulty in the common habit in most of the species of living *under stones*, in which localities almost the only vegetable matters that could serve them for food are the *mycelia* of fungi or ordinary fibrous roots.

Systematic Position, Structure, &c.

It is possible that there is no more difficult, unsatisfactory, and (I might add) thankless task than that of having to suggest the sequential position of any group in the so-called Pseudo-Neuroptera. Latreille, the founder of the genus *Embia*, placed it as a second genus in the subfamily Termitinæ. But I think Westwood happily seized upon its position as between the Termitidæ and Perlidæ. Burmeister, who justly erected these insects into a family (Embidæ), separated the White Ants from the Stoneflies by (*inter alia*) the highly specialized Dragonflies*. I do not think the relationship between *Termes* and *Embia* is so close as has generally been accepted. *Embia* evidently is not subject to those polymorphic conditions so characteristic of *Termes*, and wants its quadrifid labium (it is bifid in *Embia*). It has also much of the external form of the Perlidæ, especially of the genus *Leuctra* (which it resembles also in its extreme agility); and external form is not always to be disregarded in searching for affinities. But there are other and wide discrepancies; and the only object of these remarks is to suggest that *Termes* and *Embia* have less in common than is generally supposed.

* It is scarcely worth while to seriously notice Rambur's extraordinary arrangement. The Embidæ follow the Termitidæ; but the Perlidæ, with utter disregard of all affinities (excepting aquatic habits), are placed between the Sialidæ and Phryganidæ, with all the true Neuroptera Planipennia intervening between *Termes* and *Sialis*.

In Gerstäcker's system *Termes* precedes *Blatta*, and is separated from *Embia* by the whole of the true Orthoptera. This is a radical change; but I am disposed to agree with this author in considering *Termes* more nearly related to *Blatta* than the former is to *Embia*.

With regard to the sexual differences in the Embidæ, Westwood, forty years ago, remarked, "*sexus differentia latet.*" This obtains almost equally now; and I am not able to throw much light upon the subject. M. Lucas dissected several examples of his *E. mauritanica*; and all were apparently females. He speaks (Expl. d'Algérie) of asymmetry in the caudal processes in all the examples examined, the basal joint of the left process being much broader and more flattened than the right, and asks if this be a sexual character. I think not, and believe the asymmetry is almost (if not quite) universal in the family. All species examined by me possess it in a more or less marked degree. In some examples there is a slender spiniform process between these articulated side processes; but the materials at hand are too limited to enable me to decide if it represents the intromittent organ, or is common to both sexes*.

Respecting the genera of Embidæ, Westwood (as before stated) divided *Embia* into two sections and three subgenera, of which I reproduce the diagnoses:—

Sectio 1. Palpi maxillares 5-articulati. Antennæ thorace breviores, articulis subtus 20.

Subgenus 1. Antennæ 15-articulatæ; alæ nervo 3tio interno cum 4to nervis transversis connexo, hoc trifido. *EMBLA*, *Lat.*

Subgenus 2. Antennæ 11-articulatæ, articulo ultimo apice submammillato; alæ nervo 3tio interno cum 4to nervis transversis haud connexo, hoc bifido. *OLIGOTOMA*, *W.*

Sectio 2 (subgenus 3). Palpi maxillares 4-articulati. Antennæ corporis fere longitudine, articulis 32. Alæ nervo 4to interno trifido. *OLYNTHA*, *Gray.*

For my part I am disposed to consider the genera *Embia* and *Olyntha* identical, at any rate on the characters above given; for the maxillary palpi of *Olyntha* are 5- (not 4-) jointed (I have exa-

* In *Oligotoma Saundersii* this spiniform process has a small tooth before the apex on its lower side. I do not see the process in all the examples; hence it may perhaps be sexual, and possibly is the intromittent organ.

mined the type), and the length of the antennæ is scarcely more than a specific character. *Oligotoma* I regard as distinct on account of the different neural characters. I feel sure that the characters given for the antennæ of *O. Saundersii*, viz. "*antennæ 11-articulatæ, articulo ultimo submamillato*," are incorrect, and that these organs were broken in the example which served for type. I have six individuals of *O. Saundersii*: the antennæ are mostly broken; but in one I see clearly nineteen joints, and think that is the normal number; in others the submamillate apical structure is apparent, but this results from the organs having been broken, the small apical projection being in fact the basal portion of the succeeding joint. Rambur ('Hist. Névro-p.' p. 311) states that his *Embia Latreillii* is evidently allied to *O. Saundersii*, but has eighteen joints to the antennæ: there can, I think, be no doubt that the two are absolutely identical.

Putting on one side, then, the characters given by Westwood for the palpi and antennæ, it appears to me that only two genera can be defined with certainty at present, as follows:—

1. Alarum sector ("nervus 3tius") trifidus, cum cubito ("nervo 4to") per venulas transversales plus minus connexus. *EMBIA* (cum *Olyntha*).

2. Alarum sector bifidus, cum cubito per venulas transversales haud connexus. *OLIGOTOMA*.

Distribution of the Family.

Distribution in time may be dismissed with the remark that the larva of a species (*Embia antiqua*, Pict.) has been noticed fossil in amber.

As regards existing distribution, the species mostly inhabit the warm regions of both hemispheres. One (or more) inhabits the Mediterranean region of Europe. I have one from North Persia. India has one or more species. The group occurs in North Africa, also in Mauritius and Madagascar, and, no doubt, also in East Africa; for forms have been found enclosed in copal. Several are found in Central and Tropical South America; but nothing has been noticed from Australia.

Number of Species.

Three only were noticed by Westwood in 1837; and at present probably not more than a dozen species are in collections; for it

is practically certain that several supposed species should rank only as synonyms.

I add the descriptions of several species that appear to be new:—

EMBIA BATESI, sp. n. *Nigra* vel *nigro-picea*. Prothorax flavo-ferrugineus. Antennæ nigræ, 20-articulatæ, articulis quinis ultimis flavidis, pallide pilosis. Alæ breves, latæ, nigro-fuscæ, albido 5-striatæ. Long. corp. 7 millim. Expans. alar. 41 millim.

Hab. Brasilia (*Bates*).

Black or blackish fuscous with a piceous tinge, the prothorax above and beneath, and the head beneath (excepting at the sides) pale reddish yellow. Antennæ with 20 joints, black, clothed with grey hairs; but the apical 5 joints are pale yellowish clothed with pale hairs, the tip of the terminal joint fuscous; the 3rd joint almost as long as the 1st and 2nd united; the 4th and 5th short, submoniliform; the succeeding joints more or less elongate-oval. Maxillary palpi black, short, the 3rd to 5th joints somewhat ovate. Legs blackish, with a piceous tinge, clothed with greyish hairs; coxæ yellowish. Abdomen also with a piceous tinge, the hairs blackish; caudal appendages long, especially the 2nd joint, which is strongly flattened, obtuse, and obscure yellowish, with black hairs. Wings short and very broad, especially the posterior pair, in which the apex is almost semicircular; they are dark fuscous; the membrane set with minute blackish tubercles; five very narrow whitish longitudinal lines; neuration fuscous, but the subcosta and radius distinctly dark claret-colour; four nervules between the radius and the upper branch of the sector, discoidal cell broad, closed; and there is a transverse nervule below this cell connecting it with the upper cubitus; in the posterior wings the discoidal area has two nervules.

I have one example collected by Mr. Bates on the Amazons. I do not think it can be identical with *Olyntha ruficapilla*, Burm. (of which *Embia Klugi*, Ramb., is thought to be a synonym); for the latter has the head, as well as the prothorax, wholly reddish. It is the broadest-winged species known to me.

E. SALVINI, sp. n. *Atra*, subopaca. Antennæ (mutilatæ) castaneæ, fusco hirsutæ; cuticulo basali fusco-nigro. Alæ angustatæ, nigro-fuliginosæ, albido 5-striatæ; venis fusciscentibus. Long. corp. circa $7\frac{1}{2}$ millim. Exp. alar. circ. 13 millim.

Hab. Amer. Centr.

Body deep black, subopaque, very sparingly clothed with black

hairs. Head with a large shallow depression on the middle of the disk above; labrum slightly castaneous. Maxillary palpi having the four basal joints short, nearly equal (or the 4th slightly longer than the 3rd), not much longer than broad; 5th as long as the 1st to 3rd united, subacute: the colour of these palpi is blackish; but the sutures are paler, and they are clothed with paler hairs. Labial palpi having the 3rd joint as long as the 1st and 2nd united. Mentum very large, the sides rounded, apical margin shallowly concave; the edges are slightly thickened and raised, the median portion somewhat elevated; but otherwise the organ is shallowly concave. Antennæ (mutilated in the type, all lost beyond the 10th joint) with a stout black basal joint, 2nd small, 3rd more than twice the length of the 4th, those succeeding long, elongate-pyriform; the colour (excepting the basal joint) is castaneous, becoming gradually darker (hence probably blackish towards the apex, but with the usual pale apical portion); they are clothed with long fuscous hairs. Pronotum raised, much narrowed anteriorly, the side margins slightly flattened; and there is a faint median longitudinal impressed line; before the anterior margin is a very deep transverse sulcus. Mesonotum rather longer than broad. Metanotum nearly quadrate. Caudal appendages very long, brownish, clothed (as is the apical portion of the abdomen) with yellow hairs; between them is a stout, yellowish, simple, spiniform process. Legs shining blackish, clothed with yellowish hairs, the tarsi somewhat castaneous. Wings narrow and elongate, smoky blackish, with five longitudinal, narrow, whitish lines, whereof the 4th becomes confluent with the 5th before its apex in the anterior wings; neuration fuscous; radius and subcosta blackish with pale margins; two transverse nervules between the radius and sector; discoidal cell very long, closed; and there is a second transverse nervule in the discoidal area before the apex; two transverse nervules between the discoidal cell and cubitus, somewhat toward the base.

One example (♂?) from Central America, taken by Mr. Salvin at Chinautta, at an elevation of 4100 feet.

Dr. Hagen, in his 'Neuroptera of N. America,' p. 7, indicated a larva from Cuba. Later on, in his 'Synopsis Embidinarum Synonymica,' he applied the name of *Olyntha cubana* to this, and says he then possessed the imago; but no description is given. Supposing the larva to be full-grown, the size given (length 4 mil-lims.) would appear to indicate a smaller species than *E. Salvini*.

E. PERSICA, sp. n. *Nigra subnitida*. Caput vix in medio piceo tinctum. Pronotum brunneum. Antennæ nigræ, basin versus pallido cinctæ, 24-articulatæ; articulis duobus ultimis flavidis. Alæ angustæ, fuliginosæ, albido 5-striatæ; venis fuscis. Long. corp. circa $9\frac{1}{2}$ – $10\frac{1}{2}$ millim. Exp. alar. $13\frac{1}{2}$ –15 millim.

Hab. Persia septentrionalis.

Black. Head somewhat shining, sparingly clothed with greyish hairs; in form broad, subquadrate, almost truncate posteriorly, with the hinder angles rounded; on the middle of the disk is a large, nearly circular depression tinged with piceous. Maxillary palpi having the 1st joint longer than the 2nd and 3rd, the 4th and 5th very stout, the 5th obtusely oval, scarcely longer than the 1st. Labial palpi very short and stout, the terminal point very obtuse. Mentum small, transversely subquadrate with straight sides and truncate anterior margin. Antennæ scarcely longer than the head and pronotum, 24-jointed; basal joint short and thick, 2nd, 4th, and 5th scarcely longer than broad, the 3rd somewhat longer (the 2nd to 6th each with a narrow yellowish ring at the apex); afterwards they become longer, but scarcely one half longer than broad; the terminal two joints dingy yellowish; otherwise the colour is black, clothed with greyish hairs. Mandibles testaceous. Pronotum short, considerably narrowed anteriorly, with a transverse impressed line; colour brown, clothed with greyish hairs: prosternum distinctly pale yellow. Meso- and metanota shining black, the former oblong, the latter nearly quadrate. Legs dark piceous, clothed with greyish hairs. Abdomen blackish piceous, paler beneath, clothed with yellowish-grey hairs; caudal appendages short, the second joint brownish, clothed with yellowish hairs. Wings narrow, dark fuliginous; neuration fuscous, the space between the subcosta and radius dark fuscous; and these veins are somewhat vinous in colour, and the radius is narrowly margined with whitish on its lower edge; five narrow whitish longitudinal lines: discoidal cell very long, closed, and then an additional transverse nervule in its area nearer the apex; two or three transverse nervules between the radius and upper branch of the sector, and one between the lower branch of the sector and the cubitus.

I have three examples (all ♀?) from Shahrud, North Persia, collected by Herr Christoph.

E. Solieri, Rambur (from the south of Europe), of which, I think, only the larval form has been observed, appears to have

twenty-one joints to the antennæ; it can hardly be identical with this Persian species. Hagen indicates another species as *E. nigra* (but without description), from Egypt, which he considers distinct both from *E. Savignyii* and *E. Solieri*.

Obs.—The figure of *E. Savignyii*, given by Savigny ('Desc. de l'Egypte'), appears to have been taken from an individual with partially aberrant neuration. It will be noticed that in the right anterior wing (copied by Westwood) the lower forked branch of the sector has the upper prong of the fork again furcate; this is not indicated in the left wing.

OLIGOTOMA MICHAELI. Atra, subnitida; capite infra in medio paulo rufescente. Antennæ 24-articulatæ, nigræ; articulis 5-6 ultimis flavidis, ultimo parvulo. Pedes nigri, fusco-pilosi, tarsis subtestaceis. Alæ nigro-fuscæ, albido 4-striatæ; venis plerumque nigris. Long. corp. $10\frac{1}{2}$ millim. Expans. alar. 18 millim.

Hab. in India orientali.

Deep black, somewhat shining. Head elongate, with a large, nearly circular, shallow depression on the disk above; eyes large; beneath, the portion below the labium, joining on to the neck, is reddish. Antennæ black, with black hairs, 24-jointed, the 1st joint large but short, 2nd very small, 3rd nearly as long as the 1st and 2nd united, the succeeding two or three joints rather short; but afterwards they became elongate; gradually decreasing in length near the apex, the apical five joints yellowish, and the 6th from the apex also tinged with yellow, the terminal joint small and obtuse: in length the antennæ nearly equal the head and thorax united. Maxillary palpi stout, the last two joints longer than the others. Pronotum much narrowed in front, nearly twice as long as broad. Meso- and meta-nota nearly equal. Legs black, with blackish hairs; knees and tarsi somewhat testaceous. Abdomen black, with black hairs; caudal processes long, but very asymmetrical, black, with black hairs; the right has the basal joint very broad, nearly quadrate; whereas in the left it is slender and fully twice as long; a slender process with piceous apex projects from the base of the right; ventrally is a large triangular projection of the last segment, concave above. Wings narrow, dark smoky fuscous, the membrane transversely rugose (but not visibly tuberculate); the costal margin appears darker in consequence of the thick, black, coalescent subcosta and radius; the oblique postcostal vein also thickened and deep black; the

sector deep black and strong, the other veins fine and inconspicuous; 4-5 evident pale costal veinlets, and three veinlets in both pairs between the radius and the upper branch of the sector; but there are no other transverse veinlets; hence the discoidal cell is open; four very narrow whitish longitudinal lines.

A well-grown larva is 12 millims. long. The antennæ much shorter than in the imago. The colours generally lurid-fuscous rather than blackish, with the posterior portion of the head, the whole prothorax, and the legs more or less testaceous; and the whole underside is pale; the abdominal segments above with a brownish tinge, clothed with sparse yellowish hairs; the caudal appendages present; just the same asymmetry as in the imago.

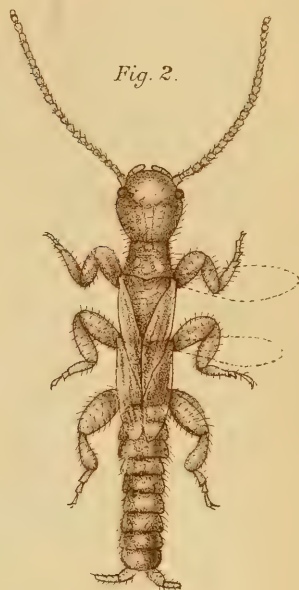
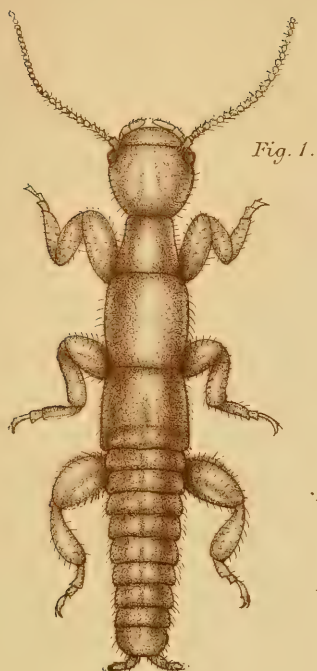
A starved "nymph" is only 9 millims. long. The colours similar to those of the larva: and the form also generally similar; but the legs are more slender (as in the imago), the asymmetry in the caudal appendages less striking (is it of the same sex?). The rudimentary wings elongate-oval, with evident neuration, characteristic of the genus; the anterior extending to the posterior margin of the metanotum, the posterior to the posterior margin of the second dorsal abdominal segment.

This is the species alluded to at the commencement of this paper, found by Mr. Michael in one of his hothouses among plants of *Saccolobium retusum* imported from India. In its wing-structure it agrees generically with *O. Saundersii*, which is also an Indian species.

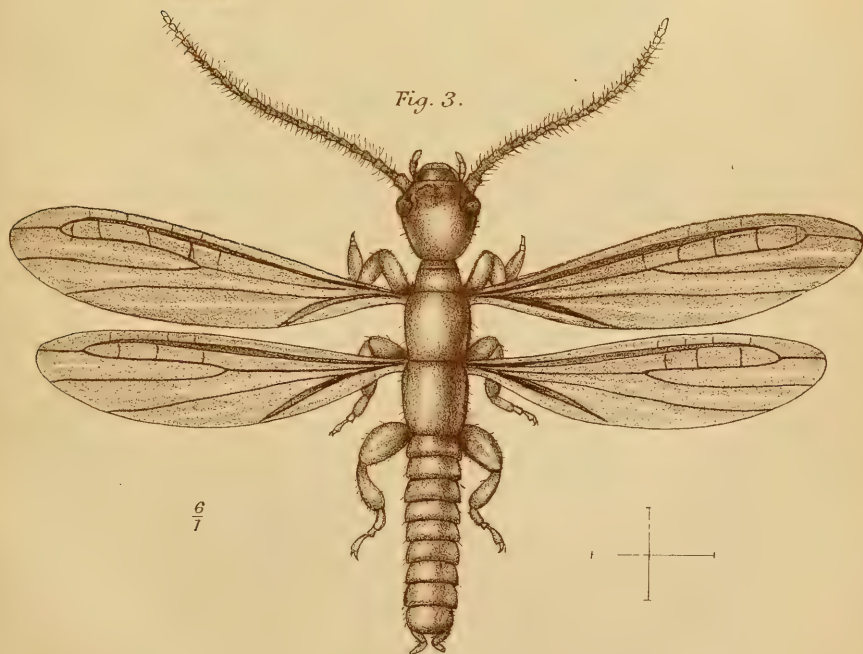
DESCRIPTION OF PLATE XXI.

Fig. 1. *Oligotoma Michaeli*, a full-grown larva shown about six times its natural size.

2. The nymph-stage of the same insect (possibly in a starved condition), also enlarged six times nat. size. The dotted lines on the right hand of the figure denote wing-outline as when expanded.
 3. The perfect insect of *O. Michaeli*, magnified six times nat. size.
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$\frac{6}{7}$



$\frac{6}{7}$